

In claim 63, line 3, after  $MW_n$ , insert -- (uncured) --.

#### REMARKS

In accordance with the above amendments, claims 38, 40, 42, 43, 51-53 and 62, 63 have been amended. Claims 38-64 remain under consideration in the application and no claim has been allowed.

Claim 38, 40, 43, 51, 52, 53, 62 and 63 have been amended to indicate that the molecular weight  $MW_n$  used is for the uncured polymer.

With respect to the rejections on the merits, the rejection in Item 2 of the Office Action has previously been discussed at length and, it is believed, adequately met. Bradford et al do not mention poly(tetramethylene adipate) (PTMA), the compound used in this invention, nor do they mention any effect on mechanical properties. They specifically disclose use of only a relatively low molecular weight PGA prepolymer. Chi et al do not mention mechanical properties or (as we have previously laboriously demonstrated) the PTMA compound of the present invention nor does Willer. Note also that the elongation achieved by Willer is only 20-29%. With PGA (72% solids and 16% with GAP) 59% solids, the results of Fleming's examples which use PGA of unspecified molecular weight also show very low elongation

(21-28%).

With respect to Item 4, it is first noted that Voigt, Jr. '442 discloses a very different kind of composition than the present application. That composition is basically all solid particles of RDX in a contiguous mass of solid TNT containing a small amount of thermoplastic, already fully cured, polyurethane additive (0.12-1.8% per examples). One of the thermoplastic elastomers that Voigt, Jr. discloses (Estane 5702 B.F. Goodrich) is alleged to contain PTMA (MW unknown). According to Voigt, Jr. Estane 5702 contains not only isocyanate-cured PTMA as the Examiner implies, but also includes isocyanate-cured 1,4-butanediol (column 3, line 3). Voigt, Jr. further teaches that any preformed thermoplastic solid polyurethane elastomer which is fully reacted, i.e., contains essentially no free isocyanate groups, and is soluble in TNT, is suitable for use in his invention (column 6, lines 38-41), clearly indicating no preference to any particular compound. Applicant can find no teaching whatever in that reference that would lead to utilize the particular compound (PTMA) at all, let alone in the manner of the present invention.

While Wanninger et al '526 mentions and contrasts Estane binders (column 1, lines 38-52), they clearly disclose none in

particular and there are apparently dozens of Estanes based on various polyesters as well as polyethers and polycarbonates. Note further that Wanninger et al deals with pressed charges, rather than the cast charges of the present inventions.

The rejection in Section 5, under 35 USC § 103(a) is also respectfully traversed. Sutton et al paint broad, generalized strokes with regard to polyester polymer binders mentioning a preference for a "carboxy-terminated, hydroxy-terminated, and isocyanate-terminated linear polyesters having a molecular weight ranging from 500-15,000, preferably from 5,000 to 12,000" (column 4, lines 54-57). It is submitted that they teach nothing that would lead one to select the particular compounds of the present invention. In their numerous examples, they use only carboxy-terminated PGA with a molecular weight of about 2,000 and another carboxy-terminated polyester (Witco F-17-80) with a molecular weight of 1,550. The remaining references in this rejection mention PTMA only in passing as one of many suitable polyesters without the slightest reason for making a particular selection. Thus, it is believed this combination also does not render the inventive step of the present invention obvious.

As a further note, this application does not pretend to claim the invention of the PTMA polyester itself and applicant

agrees that it is known in the polymer art. It is also within the ability of one of ordinary skill in the art to accomplish some optimizing of a result-effective variable. However, prior to the present invention, there is no reason to expect the highly improbable and unexpected results with respect to mechanical properties that have been accomplished in the claimed propellant and binders. The far superior tensile properties enabled by the present invention now claimed could not possibly have been predicted on the basis of the prior art.

In accordance with the above amendments, taken together with the remarks herein, applicant believes that the present claims are patentably distinct from any of the references, taken either singularly or in combination, and reconsideration and allowance of the claims is respectfully requested.

Respectfully Submitted,

NIKOLAI, MERSEREAU & DIETZ, P.A.

A handwritten signature in black ink, appearing to read "C. G. Mersereau". The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

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# **CERTIFICATE OF MAILING**

I hereby certify that the foregoing Amendment (6 pages) and a Petition for Extension of Time and a check for \$110.00 in response to the Official Action of August 1, 2000, in application Serial No. 09/088,163, filed on June 1, 1998, of John R. Moser, Jr., entitled "REDUCED ENERGY BINDER FOR ENERGETIC COMPOSITIONS" is being deposited with the U.S. Postal Service as First Class mail in an envelope addressed to Commissioner of Patents and Trademarks, Washington, D.C. 20231, postage prepaid, on November 30, 2000.



Anna C. Lemke

On Behalf of C. G. Mersereau  
Attorney for Applicant

Date of Signature: November 30, 2000